

Written evidence submitted by The SAS Institute (DHS0040)

Policy area 1 The care of patients and service users

Evidence required: Use of NHS App for different purposes e.g.: seeing enhanced range of services from local pharmacies; corresponding with GPs; managing hospital appointments (see: A plan for digital health and social care).

The app could be used for personalised health using other non-health data sets and incorporating individual recommendations to help citizens engage with and manage their health.

Uptake of digital technologies by individuals with long-term health conditions and co-morbidities and creation of system level ICS regions is a chance to embed digital technologies within the care pathway to manage and support citizens waiting for treatment. E.g., Mental health - those who opt in could receive personalised comms for relevant community support networks and charities, self-help resources and encouragement to track daily mood and activity on free applications to provide the clinician they eventually see with more data to aid in a positive outcome and accurate diagnosis. It will also ensure that those waiting 12-18 weeks for a consultation are not left isolated and feel they have not been forgotten.

The key transformation factor in terms of NHS application expansion is to move beyond the use of mobile phones as merely portable devices to embrace the broader telemetry capabilities that they can facilitate.

The use of mobile devices for delivery of hyper-personalisation has exploded in recent years. Online retailers can deliver unique landing pages to every single customer that logs into their application operating at scale with up to hundreds of thousands of unique landing pages being rendered per second at peak log-in times. These pages will take into consideration the users' location, whether they are in a vehicle or near an own brand or competitors retail outlet. It will consider their transaction history and also factor in the weather, time of day and other environmental factors.

The retailers' aim is to ensure they maximise their share of the customers wallet at every opportunity by offering potential impulse purchase offers but also defending against competitors by reminding the user of key factors such as price or returns service to maintain loyalty. Consumers are being encouraged to experience the brand rather than interact via a series of transactions.

The NHS has a goal to maximise its impact on population wellbeing and individual health whilst increasing efficient service delivery. The use of mobile devices has a plethora of potential uses in moving citizens from experiencing a series of healthcare episodes to more of a sense of being cared for by the NHS. A simple helper application example would be building upon timely appointment reminders by also suggesting routing options (it can learn a user's mode of travel preferences) and providing real-time prompts to get the patient there on time or warn the delivery staff in advance of tardy arrival or non-attendance. Offering wait-listed patients these DNA slots based on clinical urgency and proximity would also become a possibility for certain outpatient services.

More advanced applications would enable lifestyle data to be consumed and used for risk factor identification, personalised healthy-living prompts or early interventions. Such lifestyle data could be generated by the device e.g., sleep patterns or other bio surveillance data capture, inferred by location data such as multiple hours in the pub or regular late trips to unhealthy food outlets or may be generated by third party apps such as supermarket loyalty applications examining the healthiness of a user's basket or gym membership and use tracking.

Data required: Age and ability profile of users of the NHS application

SAS has developed ways that enable those with accessibility issues to interact with data. For example, enabling the visually impaired to talk to a dashboard and have it explain itself.

Hospitals in England utilising NHS app facility to book and manage appointments and correspondence. It is important to build smarts into the booking/appointment process that pick up on missed appointments and lack of engagement to protect against people being lost in the system. This needs an ICS capability to monitor these alerts and help people get into the right pathway. Air traffic control for bookings would make a massive difference to access, delays, wasted clinic time and outcomes.

Policy area 2 The health of the population

Evidence required: Progress on development of Trusted Research Environments

Understandably there is a strong focus on how to integrate NHS data and this has been ongoing for many years. We are the foundation technology used by NHS Digital to ingest, clean and integrate data from across the NHS for using in planning, research and management publications. This is sickness and treatment data, it's a lagging indicator of wellness. Also, we risk perpetuating health care inequality since only those treated are represented in the data. We must look to wider non-health datasets eg. supermarket shopping data, housing, foodbanks, voluntary/charity sector data to help people stay well and signpost relevant services.

We are working with a research oncologist at Uni of Cambridge to progress the SHERLOC initiative which aims to derive digital biomarkers from changing behaviours in shopping data for early cancer detection. We have also done work in Denmark to derive biomarkers from initial hospital assessment data that has saved over 100 lives and millions in unnecessary treatment to date. Lastly, the quality of the clinical system has c10% impact on health outcomes versus 60%+ from our behaviours (diet/exercise/habits). Yet the NHS spends over 97% of its budget on treatment of sick people. More focus and money should be allocated by ICSs for preventative primary and social care. For the NHS to take on this wider challenge of "how do we keep people well?" rather than "how do we treat people when they are sick?" needs a wider view of integrating non-health and health data to spot early patterns that increase health risks.

Policy area 3 Cost and efficiency of care

Evidence required: the process of selling and buying equipment and innovative technology in the NHS market, including NHS partnerships with innovative companies

Taking our risk stratification technology and learnings from work at HMRC and DWP achieving savings of £3 billion per year, we ran a pilot with 4 trusts and found savings of 1% of spend. Scaled to the NHS this equates to over £1 billion of procurement savings. SAS are working with NHS leadership to join up policy and financial transaction data so that policy can be enforced and evidence can be used to feedback into the improvement of policy.

See SAS whitepaper for further detail: https://www.sas.com/en_gb/whitepapers/finding-the-billions-down-the-back-of-the-nhs-sofa.html

Evidence required: How digital tools have or have not made cost savings in patient care, and any processes used to evaluate innovations.

Before new purchases of technology take place, it would make sense to first explore how current technology could be modernised and integrated. There is a history of large capital outlay to buy

new technology to replace the old, however the new rarely completely replaces the old so the cost is additive. Little is made available for ongoing maintenance so the system falls into disrepair over 3-5yrs and the cycle repeats itself. Adopting a repair/modernise before considering replacement would save time, money and lower risk, providing for a more sustainable approach.

[Policy area 4 Workforce literacy and the digital workforce](#)

Evidence required: Progress on enablement of recruitment, retention and growth of these staff groups.

The [SAS STEP programme](#) offers a free source of data literacy and new digital talent for the NHS.

Also, SAS ran a pilot with NHS Shared Business Services (NHS SBS), using Electronic Staff Record data for predicting nurses expected to leave, the reasons and recommended actions to retain.

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